and the second row of esophageal and pharyngeal sutures placed and tied.

As Doctor Graham says, the after-care is very important; in fact, upon it depends the success or failure of the whole procedure.

The use of a permanent feeding tube through the nose is troublesome, uncomfortable, and not clean. I much prefer to pass through the mouth and pharynx at feeding times a small stomach tube: this does not disturb your sutures any more than a permanent tube, and the patient is much more comfortable between feedings.

The tracheal opening in the skin certainly does contract and the removal of subcutaneous fat does not prevent this; in fact, it increases this possibility, and the contraction will be just so much greater. A tracheotomy tube must be worn for six months or so, after which time the patient may assume the entire care of it himself. For weeks, however, the operator will have to place and replace this tube as it is forced out, for the patient becomes very nervous over this slight accident, and patient training and encouragement are necessary before he will assume this care.

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JAMES F. PERCY, M. D. (1030 South Alvarado Street, Los Angeles)—In my experience, removal of the larynx is one of the most discouraging procedures in surgery. The immediate postoperative results are usually practically perfect, but within two weeks most of these victims of cancer are dead from bronchopneumonia. Just now I cannot recall that I have ever seen an early case of laryngeal cancer, even of the intrinsic type. I get them after respiratory obstruction and repeated attempts at making an exact diagnosis, including one or more biopsies, have done their worst. When surgeons will give up this mischievous and damaging practice in any form of cancer is one of the real educational problems for the future to solve.

The technique as outlined in Doctor Graham's paper is above criticism, except possibly from the viewpoint of the anesthetic. I give practically all of my patients one hypodermic dose (only) of hyoscin gr. 1/150, and morphin gr. ¼, after they are placed on the operating table. Ether is started as soon as the operative field is prepared. This is employed until the T-shaped incision can be made through the skin with the cautery knife. By that time the hyoscin and morphin are usually all that is required to take the patient through to the completion of the operation. In this way the total quantity of ether rarely exceeds two or three ounces. Every step of the operation is done with my cautery knife. Thus I have no blood in the field at any time, and the patient is also relieved of the danger of my disseminating and stimulating his cancer with a cutting instrument that is not fortified by heat.

Laryngectomy will never have a low postoperative mortality until surgeons can remain with the patient, as I am told MacKenty does in New York, until they feel that the period for complications has passed. Matas of New Orleans meets a similar problem in his postoperative aneurysmorrhaphy patients by personally remaining with them all night the first night. The second and third nights his first and second assistants take their turn, while on the fourth night Doctor Matas again remains with the patient if it is necessary. When his assistants are on duty they also report by telephone to him every two hours during the night. Only by the general adoption of some such plan comparable to that which has been so successfully worked out by these two master surgeons will the present oppressive mortality of total laryngectomies be reduced to within reasonable limits.

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SIMON JESBERG, M. D. (500 South Lucas Avenue, Los Angeles)—Doctor Graham's technique is described in such a manner that it seems delightfully simple and easy of accomplishment. However, the best results of this kind of surgery cannot be had till these cases are turned over early to the man who has perfected himself in this field of surgery. Early diagnosis would more often be made if laryngologists considered every middle-aged patient complaining of hoarseness, as cancer of the larynx until proven otherwise. The diagnosis of early cases is not always as easy to establish; biopsy in many cases is indispensable, but should be followed by surgery as soon as diagnosis is established. Tracheotomy about ten days before laryngectomy lessens the patient's chance of postoperative pneumonia and mediastinal infection. This can be done with the cautery knife, thus probably preventing dissemination of cancer cells.

❋

DOCTOR GRAHAM (closing)—Instead of using more ether in my cases I am gradually reducing the time consumed in the operation and doing it all under novocain. If the patient is in good condition I finish, by preference, with the local anesthetic. None of my patients have objected to the nasal feeding tube, and the mortality in four cases this year has been nil.

THE LURE OF MEDICAL HISTORY*

CONTRIBUTIONS OF AMERICA TO SURGERY

PART I

An Account of the Surgical Accomplishments of Over One Hundred Pioneers in American Surgery

By HAROLD MAYO F. BEHNEMAN
San Francisco

PROGRESS always rests upon a small number of men of genius. Thus we have in the science of surgery in every epoch and every country, a certain number of renowned men who are the causes and pillars of this achievement." This quotation is from the pen of Dr. William J. Mayo.[1]

Through many generations, then, the writer of this article will present in the following pages only the more famous characters in this medical saga which deals with our own land of America.

The honor of leading this procession of famous names belongs to JOHN BARD (1716-1799) of New York, who in the year 1759, did *three laparotomies for extra-uterine pregnancy*. The "case-history" (as the clinical record was called in those days) is well worth quoting: "Mrs. S., the wife of a mason, about twenty-eight years of age, having one child without any uncommon symptoms, either during her pregnancy or labor, became as she imagined a second time pregnant. She was more disordered in this than in her former pregnancy, frequently feverish, the swelling of her belly not so equal, nor the motion of the child so strong and lively. At the end of nine months, when she expected her delivery, she had some labor pains, but not without absence of flow of waters or other discharge. The pains soon went off, and the swelling in her belly became gradually less, but there still remained a large indolent, movable tumor, inclining a little to the right side. She had a return of her menses, con-

* Part Two of this paper will appear in the June issue of this journal.

*This account of American surgical accomplishments is written by one who has known none of those of whom he writes, and therefore finds it difficult to present colorful, personal items concerning the men mentioned. It is then, mainly a collection from many sources of contributions made by Americans in about two hundred years of American surgery.

Grateful acknowledgment is made to Dr. Fielding H. Garrison, Washington, D. C., for his valued correction of the original manuscript.

The references will be printed at the conclusion of the entire article.

Dr. Morton making the first public demonstration of etherization at Massachusetts General Hospital, surrounded by medical staff, October 16, 1846.

tinued regular five months, conceived again, and enjoyed better health; the swelling of her belly became more equal and uniform, and at the end of nine months, after a short and easy labor, she was delivered of a healthy child, the tumor on the right side had again the same appearance as before her last pregnancy. Five days after delivery she was seized with a violent fever, a purging, a suppression of the lochia, pain in the tumor, and profuse fetid sweats. By careful treatment, these threatening symptoms were, in some measure, removed but still there remained a loss of appetite, slow hectic fever, night sweats and a diarrhea. To the tumor, which continued painful, and gradually increasing, were applied fomentations and emollient poultices; and, at the end of nine weeks I perceived so evident a fluctuation of matter in it that I desired Doctor Huck, physician to the Army, to visit this patient with me and be present at the opening of it. From the whole history we concluded that we should find an extra-uterine fetus. I made an opening in the most prominent part of the tumor, about the middle of the right rectus muscle beginning as high as the navel, and carrying it downward. There issued a vast quantity of extremely fetid matter, together with the third phalanx of a finger of a child. Introducing my finger by the side of the abscess I found an opening into the cavity of the abdomen, through which I felt the child's elbow. I then directed my incision obliquely downward to the right ileum, and extracted a fetus of the common size at the ordinary time of delivery. The frontal, parietal and occipital bones, and also of the third phalanges of the fingers of one hand separated by putrefaction, remained behind, which I also took out. We imagined the placenta and funis umbilicus were dissolved into pus, of which there was a great quantity. By the use of fomentations and detersive injections, while the discharge was copious, fetid, and offensive, and by the application of proper bandages, and dressing with dry lint only, when the pus was laudable, the cavity contracted, filled up, and was cicatrized in ten weeks. The source of the hectic being removed, with the help of the bark elix. of citriol, and a proper diet, she quickly recovered good health. Her milk, which had left her from the time she was first seized with the fever, returned in great plenty after the abscess was healed, and she now suckles a healthy infant. New York, December 25, 1759."

His diagnosis was certainly to be commended in those days of incomplete education and lack of association with other men.

His son, SAMUEL BARD (1742-1821), *organized the Columbia University Medical School,* and became its dean. He was physician to George Washington, when the seat of the government was in New York. He contributed an excellent manual of midwifery in 1807, and in 1813 became president of the College of Physicians and Surgeons in New York.

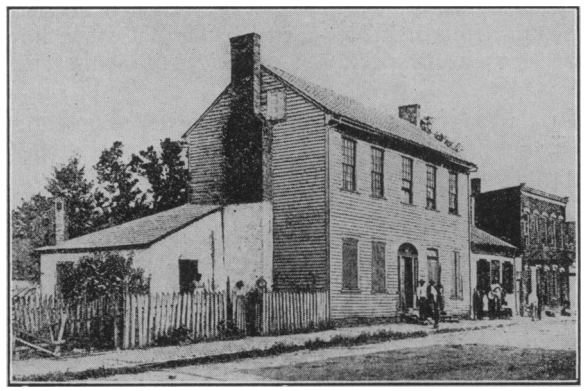
The *removal of an ectopic pregnancy,* was twice successfully achieved by WILLIAM BAYNHAM (1749-1814) of Virginia during the years from 1790 to 1799.

The first recorded amputation of the shoulder joint was done in 1781 by JOHN WARREN (1753-1815), the founder of Harvard Medical School. He was among the first to advocate healing by first intention and was professor of anatomy and surgery at Harvard for over thirty years. He was the chief founder of the Massachusetts Medical Society and its president for eleven years. His son, JOHN COLLINS WARREN (1778-1856), became a very resourceful surgeon of New York.

WILLIAM SHIPPEN, JR. (1736-1808), of Philadelphia was *the first public teacher of obstetrics in this country,* an event of some consequence for the advancement of male midwifery. He organized, with JOHN MORGAN (1735-1789), the medical department of the University of Pennsylvania, and was professor of anatomy and surgery in that institution. He gave the first course of lectures presented in a medical school in America on November 14, 1765. From 1777 to 1780, he was Surgeon-General of the United States Army. In the same field, notice must be taken of CHARLES MCKNIGHT of New York, who in 1794 removed by celiotomy, a nine months old fetus from an extra-uterine pregnancy, with full recovery.

JOHN KING of Edisto Island, South Carolina, performed a remarkable operation for abdominal pregnancy in 1816, saving both mother and child by cutting through the walls of the vagina and applying forceps with abdominal pressure exerted on the fetus from above. He wrote the *first book on extra-uterine fetation* in 1818, entitled "An Analysis of the Subject of Extra-Uterine Foetation, and of the Retroversion of the Gravid Uterus."

We must not overlook THOMAS BOND (1712-1784). "He was apparently *the first in the United States to perform lithotomy,* although there is a record of such a procedure in 1756, a DOCTOR JONES of New York being credited with this procedure. BENJAMIN FRANKLIN (1706-1790) of Boston, inventor of the bifocal lens and the flexible catheter, "asserts that it was Doctor Bond who founded the Pennsylvania Hospital." Besides their surgical contributions, "Bond and his



The Danville, Kentucky, house in which Ephraim McDowell performed the first ovariotomy. The operation was performed in the room on the left. Cut with kind permission of Dr. August Schachner.

son, PHINEAS BOND, rendered distinguished services to the American cause in 1776, by taking an active part in the organization of the medical department of the Army." [2]

A name familiar to all medical men is that of EPHRAIM MCDOWELL (1771-1830), who was *the father of gynecology in this country.* "Impressed with the sad and hopeless fate of women with ovarian disease," in 1809 he performed the first ovariotomy for the specific purpose of curing ovarian disease. He is rightly known as the "Father of Ovariotomy," and was very skillful in many branches of surgery. Friedberg states that "he founded abdominal surgery." [3] His life story has been ably and faithfully told by Samuel D. Gross and again by August Schachner of Louisville, Kentucky. McDowell's life was full of activity and events of interest. Finally settling in Danville, Kentucky, then an outpost of civilization, his fame as a surgeon spread fast, and his first ovariotomy patient lived for thirty-eight years after the operation. I wish I could present the whole story in detail of that eventful occurrence. McDowell happened to be called to a small village about sixty miles from his home to see a sick woman, one Jane Todd Crawford. When they met "it was a case of a daring man and a courageous woman coming together to settle a problem." [4] The colorful, romantic story of the events that followed is told in detail by Dr. August Schachner.[4] This brave woman listened carefully to McDowell's explanation of what he would like very much to do to her, and weighed the situation carefully for quite a while. He told her of the belief he had that he could remove this mass within her abdomen, but also honestly explained the great risk she was taking if she submitted to surgery. In the dark days before anesthesia, and modern Listerian antisepsis, fear tore at the hearts of those who realized the great mortality.

But Mrs. Crawford had deep faith in McDowell's ability and sincerity, and one day in 1809 she appeared in McDowell's home in Danville, requesting that he operate. "Considered in the light of present-day surgery, the features of the operation which bear emphasis are:

1. It was performed without an anesthetic.
2. The incision was on the left side, nine inches long, parallel to and three inches from the rectus abdominis muscle.
3. The tumor was freely movable, with a pedicle of sufficient length to enable ligation before evacuation of the contents.
4. After opening up, the successive steps were: ligation of the fallopian tubes and pedicles, near the uterus, evacuation of the contents, extraction and removal of the solid portion, replacement of the intestines, the draining of the peritoneal cavity by turning the patient over, and the closure of the abdomen with interrupted sutures allowing ligation of the pedicle to pass out the lower end.
5. The time of operation was twenty-five minutes.
6. The weight of the cyst was twenty-two and one-half pounds.
7. The recovery of the patient: in five days she was up making her bed and in twenty-five days she went home, and twenty-one years later McDowell exhibited her alive and healthy.[4]

"During many years McDowell's operation of ovariotomy failed to maintain professional approval."[3] Despite all this "it soon became the most successful major operation in surgery."[4] McDowell repeated this operation many times, with equal success.

In the next thirty-five years only four men successfully performed ovariotomy; they were Nathan Smith, Alban Goldsmith, David L. Rodgers and John Bellinger.

The first of these men, NATHAN SMITH (1762-1829), of Massachusetts, a medical graduate of Harvard in 1790, performed the second successful ovariotomy in 1821. He was a great organizer, who filled the chairs of Physiology and all other departments in the medical school of Dartmouth College, and later in Yale, Bowdoin, and Vermont. He was a very able lithotomist, and did the first staphylorraphy. Oliver Wendell Holmes described him as not "only filling a chair, but a whole settee of professorships."

Two famous surgeons, brothers too, JOHN LIGHT ATLEE (1799-1885) and WASHINGTON LEMUEL ATLEE (1808-1878), *really established ovariotomy* after McDowell's pioneer work. They perfected a technique which enabled them to perform in 1842 and 1843, four hundred and sixty-five operations. As with McDowell, they were at first bitterly condemned by colleagues and contemporaries, but lived to be highly honored and rewarded.

Contemporaries at this time of any note were comparatively few. WALTER BRASHEAR (1776-1860) of Maryland performed the *first successful amputation of the hip joint in America* in 1806. In 1799, while in China as a ship's surgeon, he amputated successfully a woman's breast. "He was a many-sided character—doctor, lawyer, legislator, naturalist, and merchant." [4] His most notable years were spent in Kentucky, from 1813 to 1817.

A hard worker and continuous contributor to our knowledge of surgery, was FREDERIC RIDGELEY (1757-1825). A staunch friend of Rush, he was the first teacher of midwifery in Transylvania University, and Surgeon-General to the army of General Anthony Wayne.

Another Kentuckian, CHARLES MCCREARY (1785-1826), first successfully excised the clavicle in 1813.

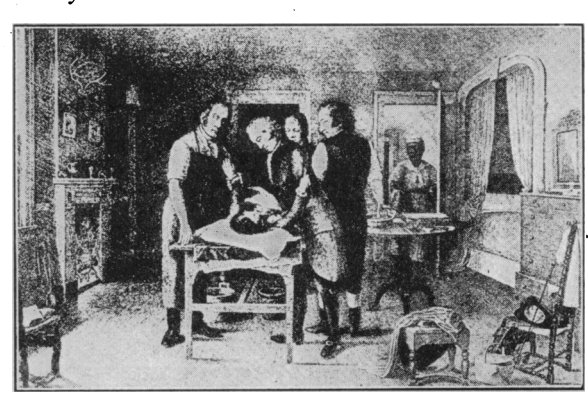
In other branches of surgery we find PHILIP WRIGHT POST (1766-1822) of Long Island, New York, who was the *first to tie the primary carotid artery in its continuity with success* (1813), as well as the first to ligate the subclavian artery outside the scaleni muscles in 1817. This was considered "his master stroke in surgery."[5] He was the first in America to ligate the femoral artery successfully, which he did in 1796, for popliteal aneurysm. Post was assisted by Valentine Mott and his ligature needle. "This was thought to be a complete success and answer to the taunt: 'What have you American physicians and surgeons ever accomplished?'" He also brought back from Europe the material for America's first museum, according to John Augustine Smith. The latter says we may deduce two useful lessons from Post's life. First, "that fortune is not so capricious in her favor as many imagine, and, secondly, to secure her favor, in other words, to attain the success of Doctor Post we must first acquire his skill and tact and what is perhaps more difficult, certainly more rare, we must practice these qualities with his steadfastness and virtue."[5]

Another great *pioneer in vascular surgery* was VALENTINE MOTT (1785-1865) of Long Island, New York. "It would be impossible to refer in detail to the individual operations, but if we inquire further into the history of the subject, we find that if the records of American operators in the ligature of large vessels (arterial trunks) are excluded, there seems to be little left to the credit of other countries."[9] Mott, in 1818, ligated the innominate artery for the first time in the history of surgery. In this dangerous pre-antiseptic period he successfully ligated one hundred and thirty-eight great arteries for aneurysm. Mott was also a bold and successful operator on the bones and joints. He did the first operation for osteosarcoma of the mandible, and he was as well the first to operate successfully for immobility of the same member. He ligated the common iliac in 1828, was the inventor of several valuable instruments, and amputated at the hip joint in 1824. It is time well spent if one turns back to the third volume of the *American Journal of Medical Science* published one hundred years ago next year, and reads the detailed account of Mott's excision of a clavicle for osteosarcoma. He was at that time professor of surgery at Rutgers College, New York. In the first paragraph of retrospection and advice he writes: "We think it may henceforth be regarded as an *axiom* that it is the duty of a surgeon to operate in every case which allows of a rational hope of success, either of improving the patient's condition or of preserving his life. It is almost superfluous to add that, in arriving at this conclusion, we do not believe it proper for every man who is *nominally* of the profession to assume such high responsibilities, but that we regard those as *surgeons,* and those alone, who have, by conscientious devotion to the study of our science, and the daily multifarious duties, acquired that knowledge which renders the mind of the practitioner serene, his judgment sound and hands skillful; while it holds out to the patient rational hopes of amended health and prolonged life."[7]

BENJAMIN WINSLOW DUDLEY (1785-1870) of Virginia was a contemporary of Mott's. For thirty-five years he was professor of anatomy and surgery in Transylvania University. He performed two hundred and twenty-five lithotomies, without a death until after Case No. 100. He made use of the lateral operation, using the gorget invented by Cline of London. Gross states that he was the *first to ligate the subclavian artery* in 1825 *for an aneurysm* "larger than a quart pitcher."[4] He ligated the common carotid in 1841, and was of note for his theories regarding the use of boiled water and boiled instruments in surgical antisepsis.

"The foremost ovariotomist of all time" was JOSHUA TAYLOR BRADFORD (1818-1871) of Kentucky.[4] At one time the *foremost surgeon of the West,* he performed thirty consecutive ovariotomies with 90 per cent cures and 10 per cent failures.

Now turning to one of the most interesting characters of his age, JOHN MCLOUGHLIN (1784-1857), the so-called "Father of Oregon," we find him responsible for the establishment of the first hospital of the great Northwest, and the first Governor on the North Pacific Coast. "His diagnostic and surgical ability was eclipsed only by his ability as a statesman."[8] His life story is one replete with adventure, romance and purpose, most of the latter directed toward medicine and surgery. "The immigrants and the Indians who had learned to love and trust their great white-faced master—in fact the whole little nation along the Columbia wept when he died and felt their little world was more lonesome when John McLoughlin went on his last call."[8] He was a pathfinder and statesman as well as a surgeon of great ability.



Prof. George Kasson Knapp's painting of "The First Ovariotomy." Cut with kind permission of Dr. August Schachner, author of "Ephraim McDowell, Father of Ovariotomy."

The "Willard Parker Hospital for Contagious Diseases" of the Health Department of New York City stands in tribute and as a testimonial to WILLARD PARKER (1800-1884) for over thirty years professor of surgery at the College of Physicians and Surgeons of that city. "He originated the operation of cystotomy (1846-1854) for irritable bladder, and the operation for perityphilitic abscess." [9] He was the first, after Hancock of London (1848), to operate for appendicitis, and tied the subclavian artery five times. He was one of the organizers of the present medical department of Syracuse University. Princeton conferred the LL.D. degree upon him in 1870. He was "so identified with the growth of charitable enterprises in the way of hospitals and dispensaries in New York City, that he was associated with most all of them." [9]

DANIEL BRAINERD (1812-1866) of New York, *"The pioneer surgeon of the Middle West,"* [10] invented the bone drill, and made several good contributions on the treatment of fractures and deformities. He settled in Chicago in 1837 and organized Rush Medical College in 1843.

WILLIAM GIBSON (1788-1868), scientist, author, artist, and friend of Lord Byron, had an eventful surgical record. In 1835 and 1838 he performed two successful cesarian sections on the same patient, who lived for fifty years after the first operation. In 1824 he published the worthy and once much-used "Principles and Practice of Surgery."

JOHN RHEA BARTON (1794-1871), in 1834, was the first surgeon to wire a fractured patella with success.

Advancing now to 1849, we find that HARBERT was the first to suggest the operation for celiotomy for ruptured tubal pregnancy in early stages, a starting point in the history of this procedure. Barton, by the way, did an osteotomy for ankylosis of the hip joint in 1826.

MASON FITCH COGSWELL (1761-1830) of Connecticut first successfully ligated the common carotid artery for primary hemorrhage in 1803.

PHILIP SYNG PHYSICK (1768-1837) of Philadelphia, "that unsurpassed lithotomist," invented the tonsillotome and was the first to describe diverticulum of the rectum. He is often called the *"Father of American Surgery"*; [10] he was Surgeon-General to the Pennsylvania Hospital in 1794 and professor of surgery in the University of Pennsylvania from 1805 to 1818. He introduced into surgery an operation for artificial anus (1826), the kid and buckskin ligatures (1816), and was the first American to wash out the stomach with syringe and tube in a case of poisoning in 1802.

An Englishman, DANIELS, of Georgia introduced the weight and pulley for extension in fractures of the thigh.

A pioneer *Army surgeon* was SAMUEL PRESTON MOORE (1813-1889). He was an Army surgeon for twenty-six years, and on November 29, 1861, was made Surgeon-General of the Confederacy. In the face of overwhelming difficulties he organized the medical department of the Confederate armies, and founded its literary organ, *The Confederate States Medical and Surgical Journal.* He made a careful study of indigenous plants during the war, as sources of materia medica, when many medical supplies were cut off from the South. Lastly he organized the Association of Army and Navy Surgeons of the Confederacy in 1863.

Another pioneer in surgery was MOSES GUNN (1822-1887), first professor of surgery at Michigan and professor at Rush from 1867 until his death twenty years later. "He made many minor and one great contribution to the science of surgery. This was his work on dislocation of the hip joint." [11]

Designated by Gross as "the great commoner of American Medicine" was WARREN STONE (1808-1872).

With Doctors THOMAS HUNT and HARRISON, he founded the Tulane Medical School of New Orleans in which he was "Stone Professor of Anatomy and Surgery." He made many surgical contributions to the *New Orleans Medical and Surgical Journal,* of which he was editor.

Let us now turn to "a spot in the wilderness of the new continent," in a little village in Georgia, where an American, CRAWFORD W. LONG (1815-1878) of Danielsville, Georgia, is seen timidly and hesitatingly, but nevertheless independently of all foreign suggestions, attempting to remove, for the first time with ether, a growth from a patient whom he has just put to sleep. This was in 1842, and the chief actor is well-nigh forgotten.

Again the scene turns to America. The lights are brighter, and we are in Massachusetts General Hospital. The date is October 16, 1846. On one side we see W. G. T. MORTON (1819-1868) of Charleston, Massachusetts, confidently administering the new letheon, and saying finally to the distinguished operator, Doctor Warren, "Sir, the patient is ready." The operation is performed without a sign of pain, and Doctor Warren, himself amazed, turns to the astonished audience, saying, "Gentlemen, this is no humbug." From that moment the idea of the suppression of pain ceased to be a dream and became a living reality."[6]

Thus to Crawford W. Long is due the honor of having first used ether as anesthesia in surgery in 1842. And thus to JOHN COLLINS WARREN (1778-1865) comes the honor of having *established ether anesthesia* in surgical practice. There is not room nor is it necessary here to discuss the bitter fight that waged through the years as to priority in this discovery. To remember that it is an American contribution is the vital thing and of that we are proud. Those who are interested more in this most fascinating story of the beginnings of ether anesthesia may turn to a paper read before the Johns Hopkins Historical Society, November 8, 1896, by Hugh H. Young,[12] entitled "Long, the Discoverer of Ether Anesthesia—A Presentation of his Original Documents." He gives the facts of the whole situation, with descriptions of the famous "ether inhalation parties," the history of the first case anesthetized by Long, and the documents pertaining to the unpleasant controversy.